POTATO (*Solanum tuberosum* 'Russet Burbank')
Rhizoctonia/black scurf; *Rhizoctonia solani*

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Evaluation of at-plant treatments for control of Rhizoctonia diseases of potato in Wisconsin, 2017.

Potatoes were planted on 3 May at the University of Wisconsin Hancock Agricultural Research Station in central WI to evaluate seed- and in-furrow-applied fungicides for the control of Rhizoctonia diseases of potato, including seedling damping-off and tuber black scurf. In preparation for planting, US#1 seed tubers were cut into approximately 2-oz pieces on 17 Apr. Seed pieces were allowed to heal for 16 days at 13°C with 95% relative humidity and airflow for suberization. A randomized complete block design with four replications was used for the trial and treatment plots consisted of four, 20-ft-long rows spaced 36 in. apart with 12 in. spacing in the row. To minimize soil compaction and damage to plants in rows used for foliar and yield evaluations, drive rows for pesticide application equipment were placed adjacent to plots. Seed treatments were applied to tubers within 24 hours of planting using a 1.06 qt Solo Hand Pump Sprayer at a rate equivalent to 3.70 L water/ton seed. In-furrow treatments were applied over the top of seed pieces in open furrows in a 12 inch band using a plot sprayer consisting of a tractor-mounted boom, pressurized with an air compressor, using TeeJet Twin Jet Flat Spray Tip nozzles TJ-60 11003VS. In-furrow applied fungicides were applied at a rate equivalent to 9.50 L water/1000 row feet at 30 psi. Two treatments also received 2 foliar sprays each at row closure and early flowering Fertility, insect, and weed management was accomplished using standard commercial practices for the region. Plots relied upon historic, ample, and generally uniformly present natural inocula for disease establishment. Seed emergence data were collected on 30 May from 20 linear feet of each of the center two rows of each plot (% seed emergence = number of emerged vines /maximum possible emerged vines (40)*100). Precipitation in Hancock during the potato production season was 22.3 in. Supplemental irrigation was applied 36 times during the potato production season for an additional 12.6 in. Vines were killed with two desiccant treatments of Diquat+non-ionic surfactant applied on 14 Sep and 21 Sep. Plots were harvested and graded on 3 Oct. At harvest, tubers from the center two, 20-ft long rows of each 4-row plot were graded for size and yield. Twenty tubers were randomly selected from each plot after washing and visually evaluated for symptoms of black scurf (% incidence= number of symptomatic tubers/20*100). All data were analyzed using ANOVA (α=0.05) and Fisher's LSD at α=0.05 (SAS Version 9.2).

Disease pressure was low in this trial. Black scurf incidence on tubers at the time of harvest was low with no significant differences among treatments. Five treatments resulted in decreased emergence when compared to the non-treated control and included: Maxim MZ 7.5DP 0.5 oz; Maxim MZ 7.5DP 0.5 oz + Quadris 2.018SC 0.6 fl oz in furrow; Cruiser Maxx Potato Extreme 0.31 fl oz; Cruiser Maxx Vibrance Potato 0.5 fl oz; and Emesto Silver 1118FS 0.31 fl oz. These treatments all consisted of a seed-applied fungicide which likely delayed the emergence. Four of these five treatment (all previously listed with the exception of Emesto Silver 118FS 0.31 fl oz) also had significantly less yield when compared to the non-treated control. No treatment had a significantly greater yield than the non-treated control.

Treatment and Rate[z]	Application Type[y]	Emergence (%)		Marketable Yield (cwt/A)[w]		Size Bs (cwt)[v]		Culls (cwt)		Black Scurf Incidence (%)
Non-treated Control		85.8	d-g[x]	560.1	ef	25.7	cd	30.7	a-c	3.8
Maxim MZ 7.5DP 0.5 oz	Seed Treatment	34.5	a	353.3	a	11.7	a	88.0	e	0.0
Maxim MZ 7.5DP 0.5 oz + Quadris 2.018SC 0.6 fl oz	Seed Treatment In Furrow	49.0	b	469.3	cd	13.7	a	40.7	b-d	0.0
Cruiser Maxx Potato Extreme 0.31 fl oz	Seed Treatment	32.3	a	379.6	ab	10.6	a	50.3	cd	1.3
Cruiser Maxx Vibrance Potato 0.5 fl oz	Seed Treatment	50.3	b	447.4	bc	17.4	ab	57.6	d	0.0
Emesto Silver 118FS 0.31 fl oz	Seed Treatment	67.8	c	493.0	c-e	21.4	bc	34.2	a-c	0.0
Quadris 2.018SC 0.6 fl oz	In Furrow	90.5	e-g	614.2	f	29.3	de	43.2	b-d	5.0
Double Nickel LC 1.7 fl oz	In Furrow	92.0	fg	593.8	f	33.6	ef	33.0	a-c	2.5
Velum Prime 6.5 fl oz	In Furrow	81.5	d-f	598.6	f	45.7	gh	26.4	ab	7.5
Regalia 5SC 4.4 fl oz	In Furrow	83.3	d-f	562.9	ef	50.1	hi	33.8	a-c	3.8
Vertisan EC1.67 1.1 fl oz	In Furrow	95.8	g	551.4	ef	55.6	i	28.0	ab	0.0
Elatus 45WG 45WG .5 fl oz	In Furrow	83.5	d-f	567.0	ef	50.2	hi	20.2	a	1.3
Priaxor 4.17SC 0.48 fl oz	In Furrow	79.5	de	577.0	f	40.3	fg	26.6	ab	2.5
Azteroid 1.65SC 0.75 fl oz	In Furrow	83.5	d-f	556.8	ef	34.4	ef	32.9	abc	1.3
SPE120-ES 0.25 fl oz	In Furrow	82.0	d-f	577.4	f	32.5	de	32.9	abc	2.5
AMV1020 0.42 oz	In Furrow	83.3	d-f	570.8	f	34.4	ef	28.0	ab	6.3
AMV1033 0.42 oz	In Furrow	75.8	cd	593.9	f	40.0	fg	30.6	abc	0.0
AMV1020 0.42 oz, 6 oz/A Foliar	In Furrow, 2X Foliar	77.8	cd	571.1	f	35.1	ef	30.4	ab	2.5
AMV1033 0.42 oz, 6 oz/A Foliar	In Furrow, 2X Foliar	75.8	cd	540.9	d-f	32.4	de	40.8	b-d	3.8

[Z] Treatment rates applied in-furrow are given per 1000 row ft. Seed treatments are given per 100 lb seed.

[Y] Seed treatments and in-furrow treatments were applied at the time of planting.

[X] Column numbers followed by the same letter are not significantly different at P=0.05 as determined by Fisher's Least Significant Difference (LSD) test.

[W] Marketable yield refers to the weight of Size A potato tubers of a size range ≥2.5 in diameter in units of cwt = 100 lb.

[V] Size B potato tubers are of a size range between 1.5 and 2.25 in diameter.